AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

LISTING OF CLAIMS:

1. (Original) A radio frequency modulator, comprising:

a phase lock loop (PLL) having an input port for receiving a modulation signal and producing as an output signal a modulated RF signal at an output port;

a phase demodulator having an input port for receiving the modulated RF signal and having an output port for providing a phase information signal;

a comparator having a first input port for receiving the phase information signal and a second input port for receiving the modulation signal and an output port for providing an error signal; and

a pre-emphasis filter in response to receiving the error signal adjusts the modulation signal provided to the PLL.

2. (Original) A radio frequency modulator as defined in claim 1, wherein the pre-emphasis filter comprises a digital pre-emphasis filter.

3. (Original) A radio frequency modulator as defined in claim 1, further comprising a direct digital synthesizer (DDS) coupled between the pre-emphasis filter and the PLL.

4. (Original) A radio frequency modulator as defined in claim 1, wherein the PLL has a transfer function and the pre-emphasis filter preconditions the modulation signal with a filter response which is about the inverse of the PLL transfer function.

5. (Original) A radio frequency modulator as defined in claim 1, wherein the phase demodulator comprises a digital phase demodulator.

6. (Original) A radio frequency modulator as defined in claim 1, wherein the modulation signal comprises a digital modulation signal.

7. (Original) A method of producing a stable and low noise modulator, comprising the steps of:

(a) providing a phase lock loop (PLL) for receiving a modulation signal and producing a modulated RF signal;

(b) demodulating the modulated RF signal to produce a demodulated signal;

(c) comparing the demodulated signal with the modulation signal in order to provide an error signal; and

(d) using the error signal to precondition the modulation signal provided to the PLL using a pre-emphasis filter.

8. (Original) A method as defined in claim 7, wherein step (d) comprises preconditioning the modulation signal in the digital domain using a digital pre-emphasis filter.

9. (Original) A method as define in claim 7, wherein the PLL has a transfer function and the pre-emphasis filter has a filter response of about the inverse of the PLL transfer function.

10. (Currently amended) A digital modulator for use in a radio frequency transmitter, comprising:

a phase-lock-loop (PLL) loop producing as an output signal a modulated RF signal;

a phase demodulator having an input port for receiving unmodified the modulated RF signal and having an output port for providing a phase information signal; and

a comparator having a first input port for receiving the unmodified modulated RF signal and having an output port for providing a phase information signal.

Please add the following new claims

11. (New) A radio frequency modulator as defined in claim 1, wherein the modulation signal is subject to a phase delay prior to being input to the second input port of the comparator.

12. (New) A radio frequency modulator as defined in claim 1, wherein the phase lock loop (PLL) comprises a loop filter coupling a phase/frequency detector and charge pump to an oscillator.

13. (New) A radio frequency modulator as defined in claim 12, wherein the loop filter is a low pass filter.

14. (New) A radio frequency modulator as defined in claim 12, wherein the oscillator is a voltage controlled oscillator (VCO).

15. (New) A radio frequency (RF) modulator comprising:

a phase-lock-loop (PLL) loop including a loop filter and receiving as an input signal a modulation signal and producing as an output signal a modulated RF signal;

circuitry for producing an injection modulation signal;

circuitry for injecting the injection modulation signal into the phase lock loop at a point before the loop filter; and

control circuitry, coupled to the circuitry for injection the injection modulation signal, for controlling the amplitude of the injection modulation signal.

16. (New) The radio frequency (RF) modulator of claim 15, wherein said control circuitry includes a phase demodulator.

17. (New) The radio frequency (RF) modulator of claim 16, wherein said control circuitry further comprises a comparison circuit.

18. (New) A method of producing phase shifts in a modulated RF signal, comprising the steps of:

producing an injection modulation signal;

injecting the injection modulation signal into a phase lock loop having a loop filter at a point before the loop filter; and

producing a modulated RF signal as an output from the phase lock loop.

19. (New) The method of claim 18, further comprising preconditioning the modulation signal in the digital domain prior to injection into the phase lock loop.

20. (New) The method of Claim 19, wherein a pre-emphasis filter is used in preconditioning the modulation signal.